



# BAP55LX

Silicon PIN diode

Rev. 5 — 12 February 2019

Product data sheet

## 1 Product profile

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### 1.1 General description

Planar PIN diode in a SOD882D leadless ultra small plastic SMD package.

### 1.2 Features and benefits

- High-speed switching for RF signals
- Low diode capacitance
- Low forward resistance
- Very low series inductance
- For applications up to 3 GHz
- AEC-Q101 qualified

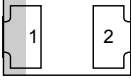

### 1.3 Applications

- RF attenuators and switches



## 2 Pinning information

Table 1. Discrete pinning

Pin	Description		Simplified outline	Symbol
1	cathode	[1]	 <p>Transparent top view</p>	 <i>sym006</i>
2	anode			

[1] The marking bar indicates the cathode.

## 3 Ordering information

Table 2. Ordering information

Type number	Package		
	Name	Description	Version
BAP55LX	DFN1006D-2	leadless ultra small plastic package; 2 terminals; body 1 × 0.6 × 0.4 mm	SOD882D

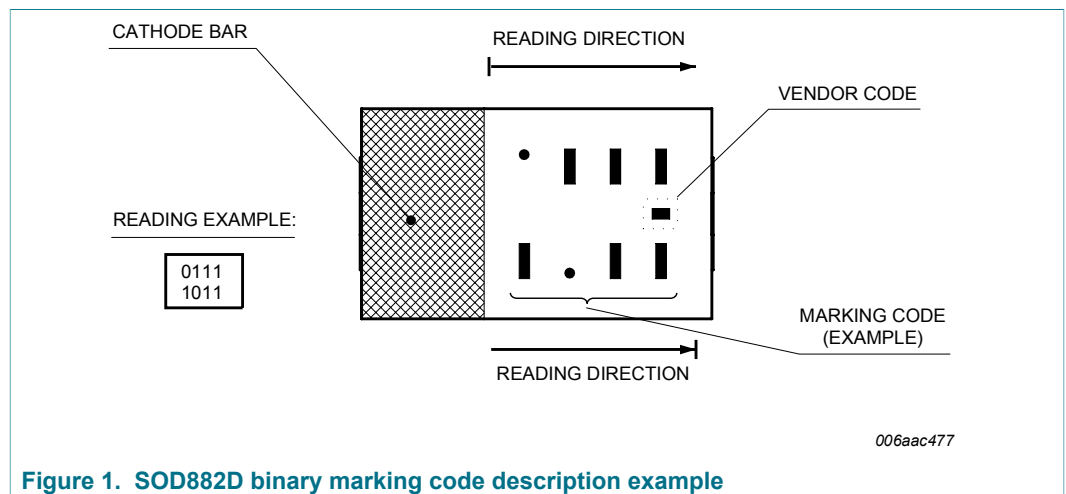
## 4 Marking

Table 3. Marking codes

Type number	Marking code <sup>[1]</sup>
BAP55LX	1111 1101

[1] For SOD882D binary marking code description (see [Figure 1](#)).

### 4.1 Binary marking code description



## 5 Limiting values

**Table 4. Limiting values**

*In accordance with the Absolute Maximum Rating System (IEC 60134).*

Symbol	Parameter	Conditions	Min	Max	Unit
$V_R$	reverse voltage		-	50	V
$I_F$	forward current		-	100	mA
$P_{tot}$	total power dissipation	$T_{sp} \leq 90\text{ °C}$	-	135	mW
$T_{stg}$	storage temperature		-65	+150	°C
$T_j$	junction temperature		-65	+150	°C

## 6 Thermal characteristics

**Table 5. Thermal characteristics**

Symbol	Parameter	Conditions	Typ	Unit
$R_{th(j-sp)}$	thermal resistance from junction to solder point		78	K/W

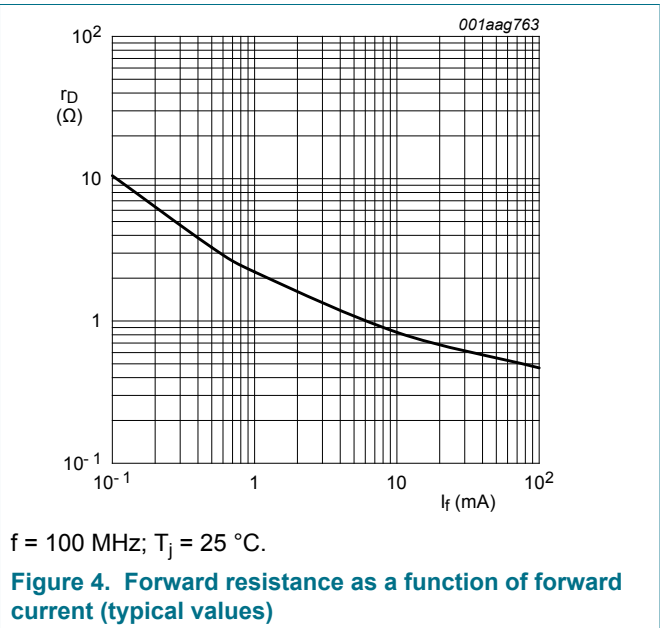
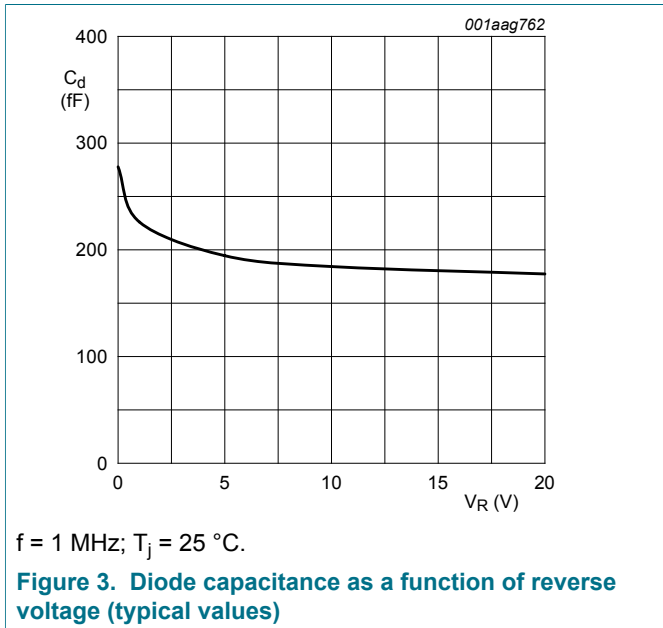
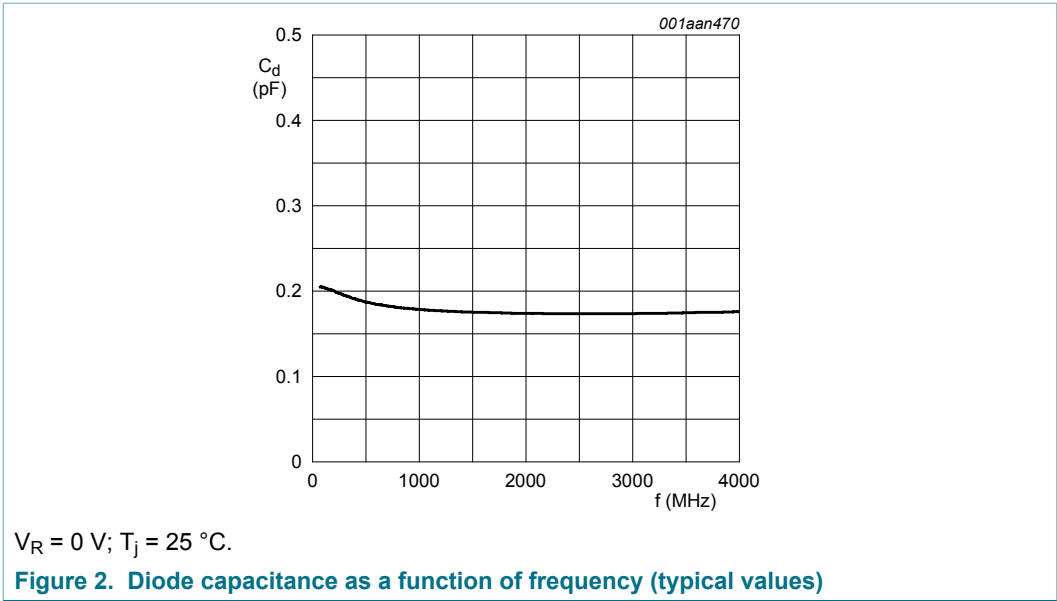
## 7 Characteristics

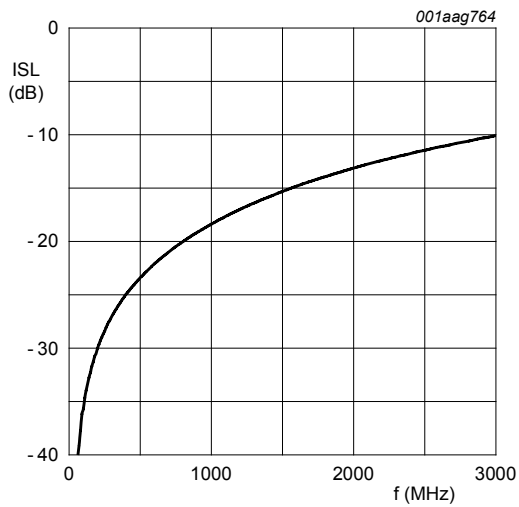
**Table 6. Characteristics**
 $T_{amb} = 25\text{ }^{\circ}\text{C}$  unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_F$	forward voltage	$I_F = 50\text{ mA}$	-	0.95	1.1	V
$I_R$	reverse current	$V_R = 20\text{ V}$	-	-	10	nA
		$V_R = 50\text{ V}$	-	-	100	nA
$C_d$	diode capacitance	f = 1 MHz (see <a href="#">Figure 3</a> )				
		$V_R = 0\text{ V}$	-	0.28	-	pF
		$V_R = 1\text{ V}$	-	0.23	-	pF
		$V_R = 20\text{ V}$	-	0.18	0.28	pF
$r_D$	diode forward resistance	f = 100 MHz (see <a href="#">Figure 4</a> )				
		$I_F = 0.5\text{ mA}$	-	3.3	4.5	$\Omega$
		$I_F = 1\text{ mA}$	-	2.2	3.3	$\Omega$
		$I_F = 10\text{ mA}$	-	0.8	1.2	$\Omega$
		$I_F = 100\text{ mA}$	-	0.5	0.8	$\Omega$
ISL	isolation	$V_R = 0\text{ V}$ (see <a href="#">Figure 5</a> )				
		f = 900 MHz	-	19	-	dB
		f = 1800 MHz	-	14	-	dB
		f = 2450 MHz	-	12	-	dB
$L_{ins}$	insertion loss	(See <a href="#">Figure 6</a> )				
		$I_F = 0.5\text{ mA}$				
		f = 900 MHz	-	0.24	-	dB
		f = 1800 MHz	-	0.25	-	dB
		f = 2450 MHz	-	0.26	-	dB
		$I_F = 1\text{ mA}$				
		f = 900 MHz	-	0.17	-	dB
		f = 1800 MHz	-	0.18	-	dB
		f = 2450 MHz	-	0.19	-	dB
		$I_F = 10\text{ mA}$ ;				
		f = 900 MHz	-	0.08	-	dB
		f = 1800 MHz	-	0.09	-	dB
		f = 2450 MHz	-	0.10	-	dB
		$I_F = 100\text{ mA}$ ;				
		f = 900 MHz	-	0.05	-	dB
		f = 1800 MHz	-	0.07	-	dB
f = 2450 MHz	-	0.08	-	dB		

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$\tau_L$	charge carrier life time	when switched from $I_F = 10 \text{ mA}$ to $I_R = 6 \text{ mA}$ ; $R_L = 100 \text{ }\Omega$ ; measured at $I_R = 3 \text{ mA}$	0.225	0.27	-	$\mu\text{s}$
$L_S$	series inductance	$I_F = 100 \text{ mA}$ ; $f = 100 \text{ MHz}$	-	0.4	-	nH

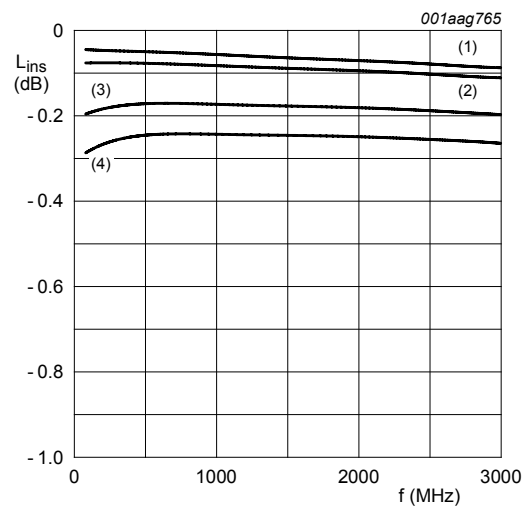
**7.1 Graphical data**





$T_{amb} = 25\text{ }^{\circ}\text{C}$   
 Diode zero biased and inserted in series with a 50  $\Omega$  stripline circuit

**Figure 5. Isolation of the diode as a function of frequency (typical values)**



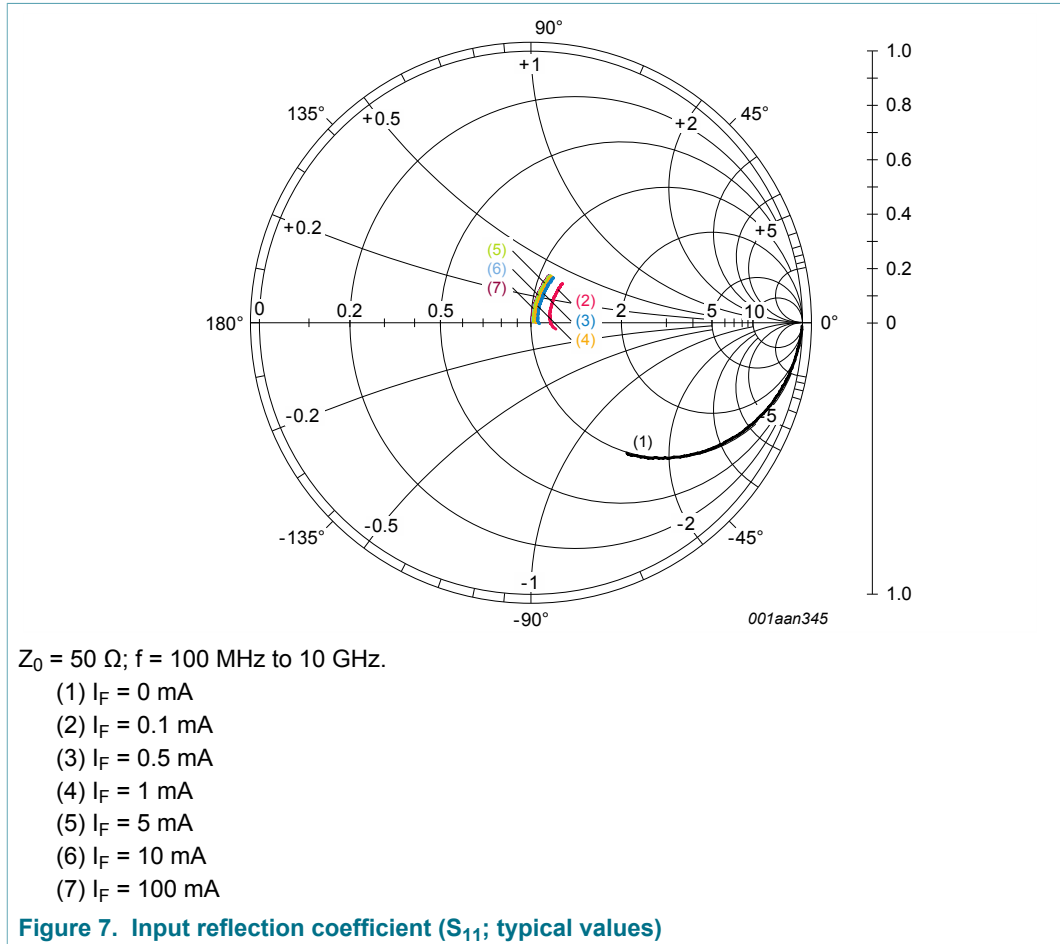
$T_{amb} = 25\text{ }^{\circ}\text{C}$   
 Diode inserted in series with a 50  $\Omega$  stripline circuit and biased via the analyzer T-network

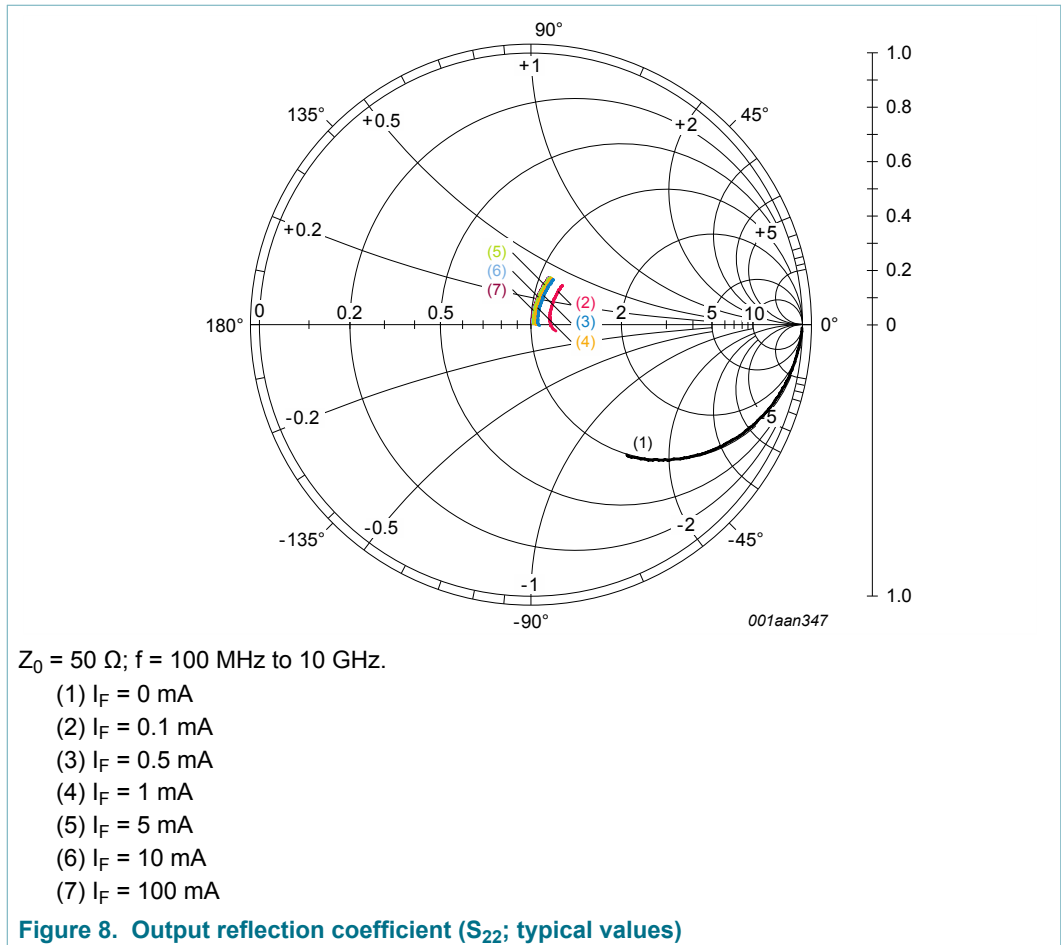
- (1)  $I_F = 100\text{ mA}$
- (2)  $I_F = 10\text{ mA}$
- (3)  $I_F = 1\text{ mA}$
- (4)  $I_F = 0.5\text{ mA}$

**Figure 6. Insertion loss of the diode as a function of frequency (typical values)**

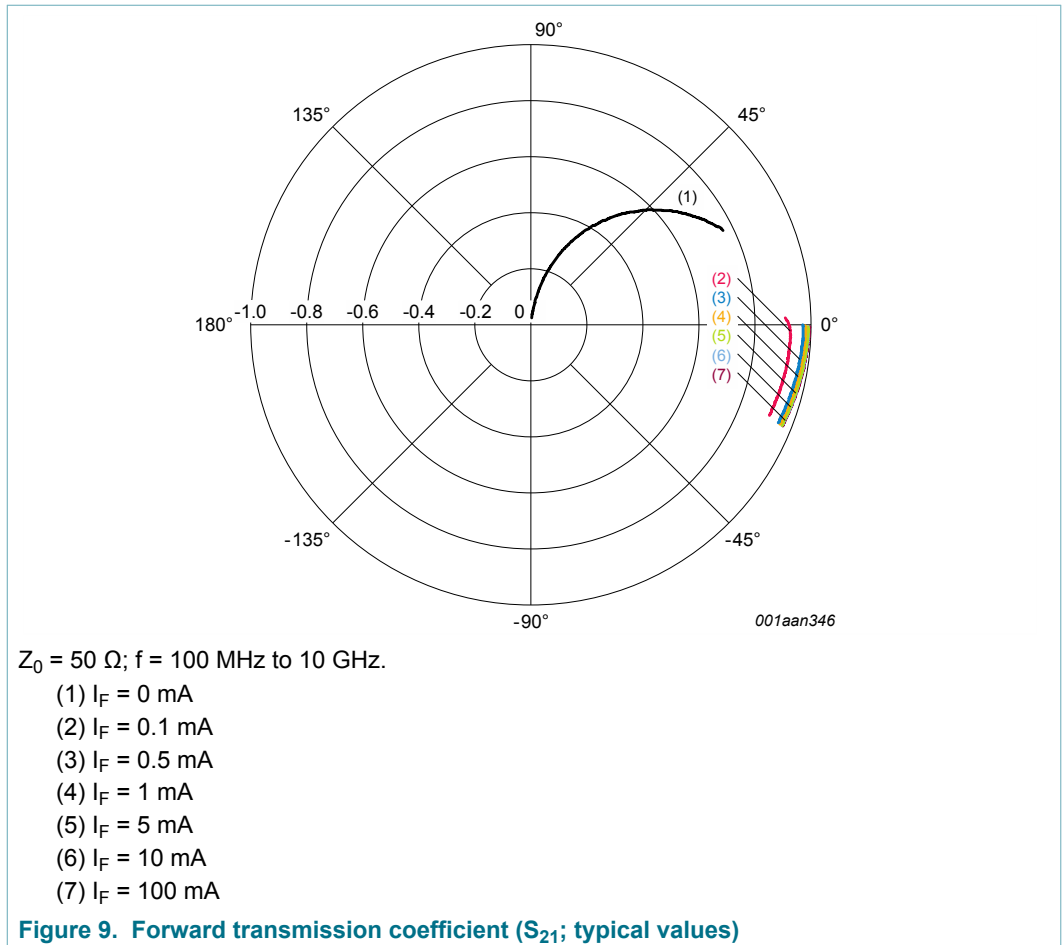
**7.2 S-parameters**

**7.2.1 Diode in series configuration**

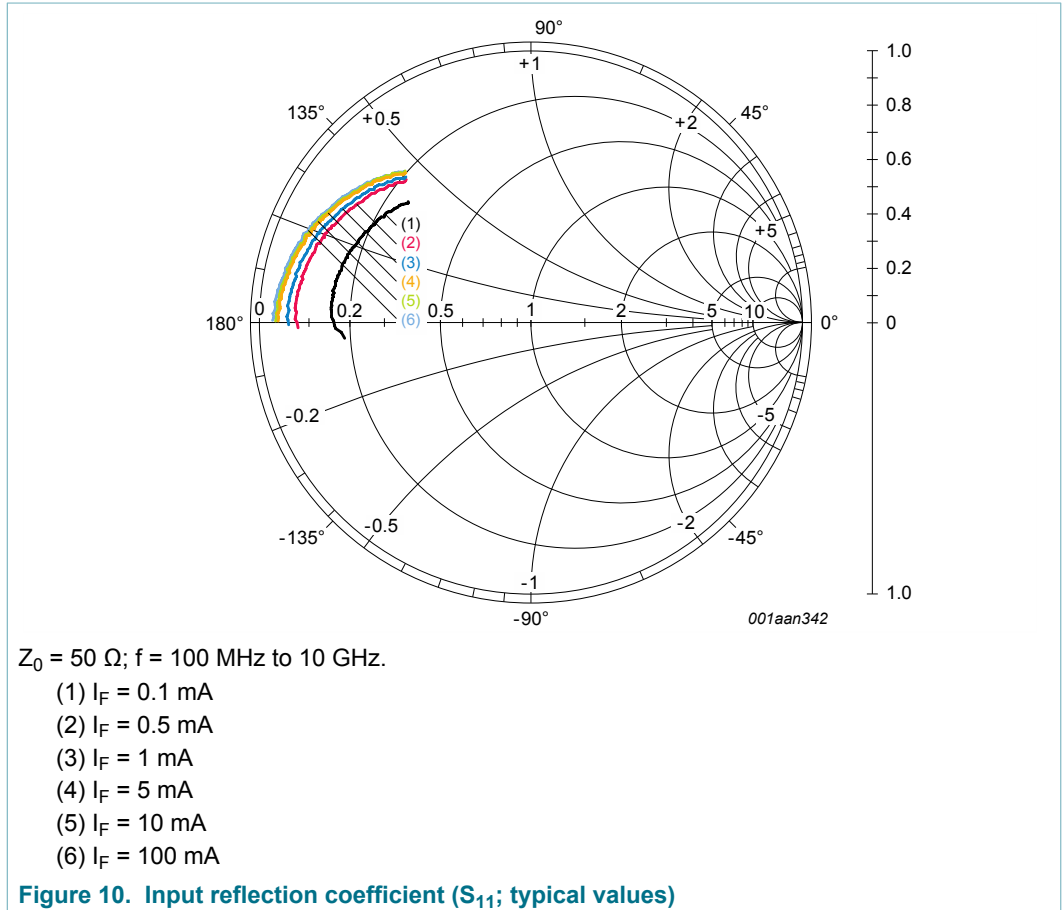


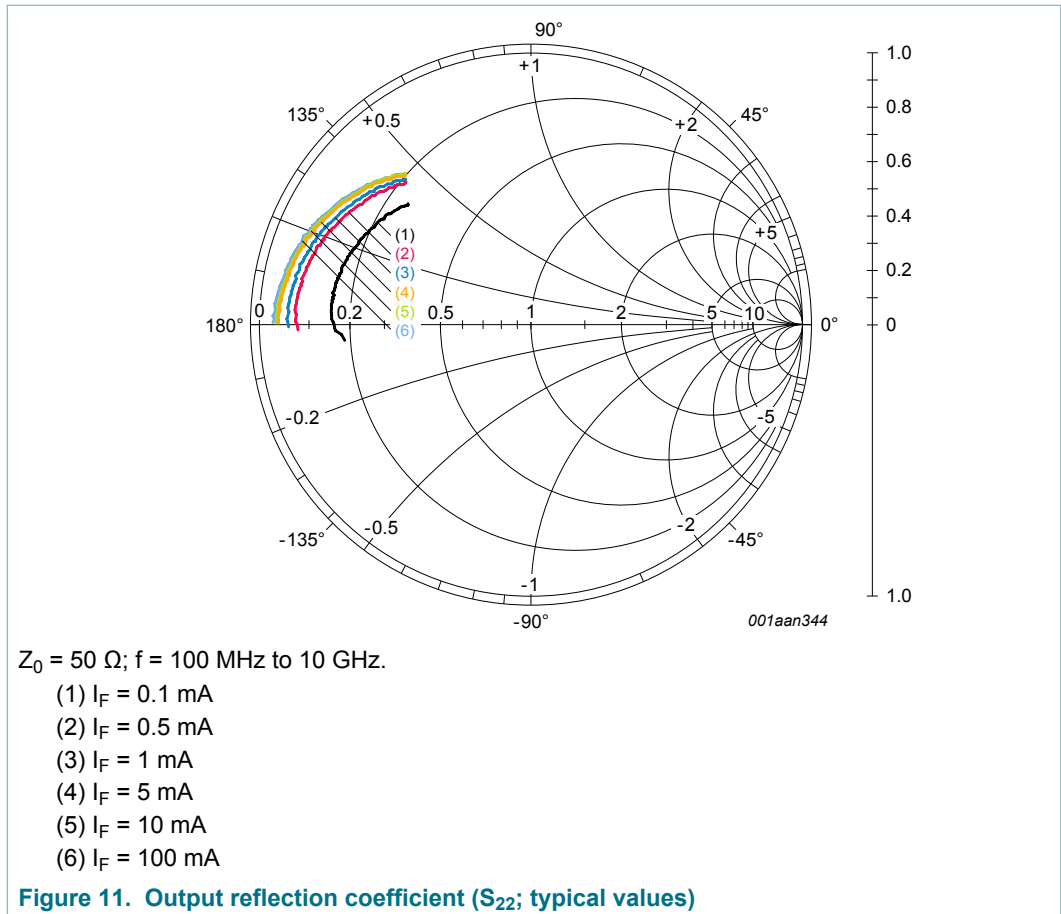


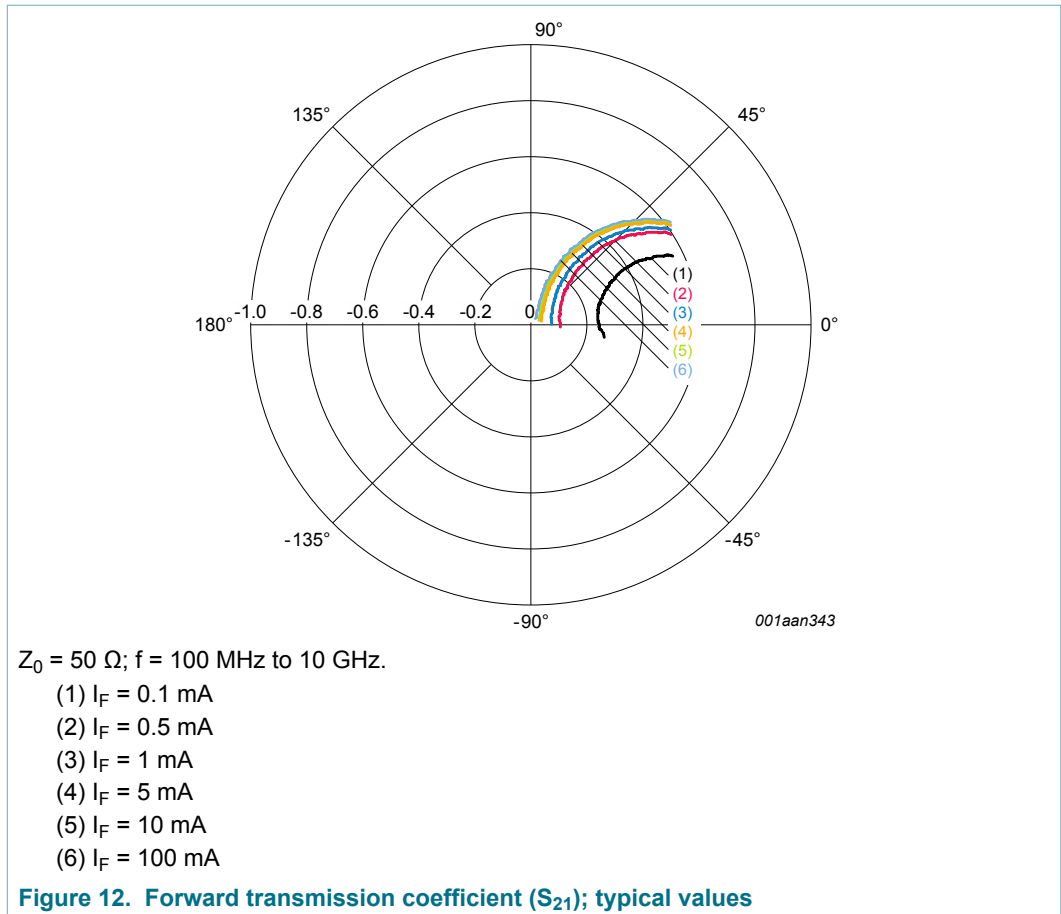




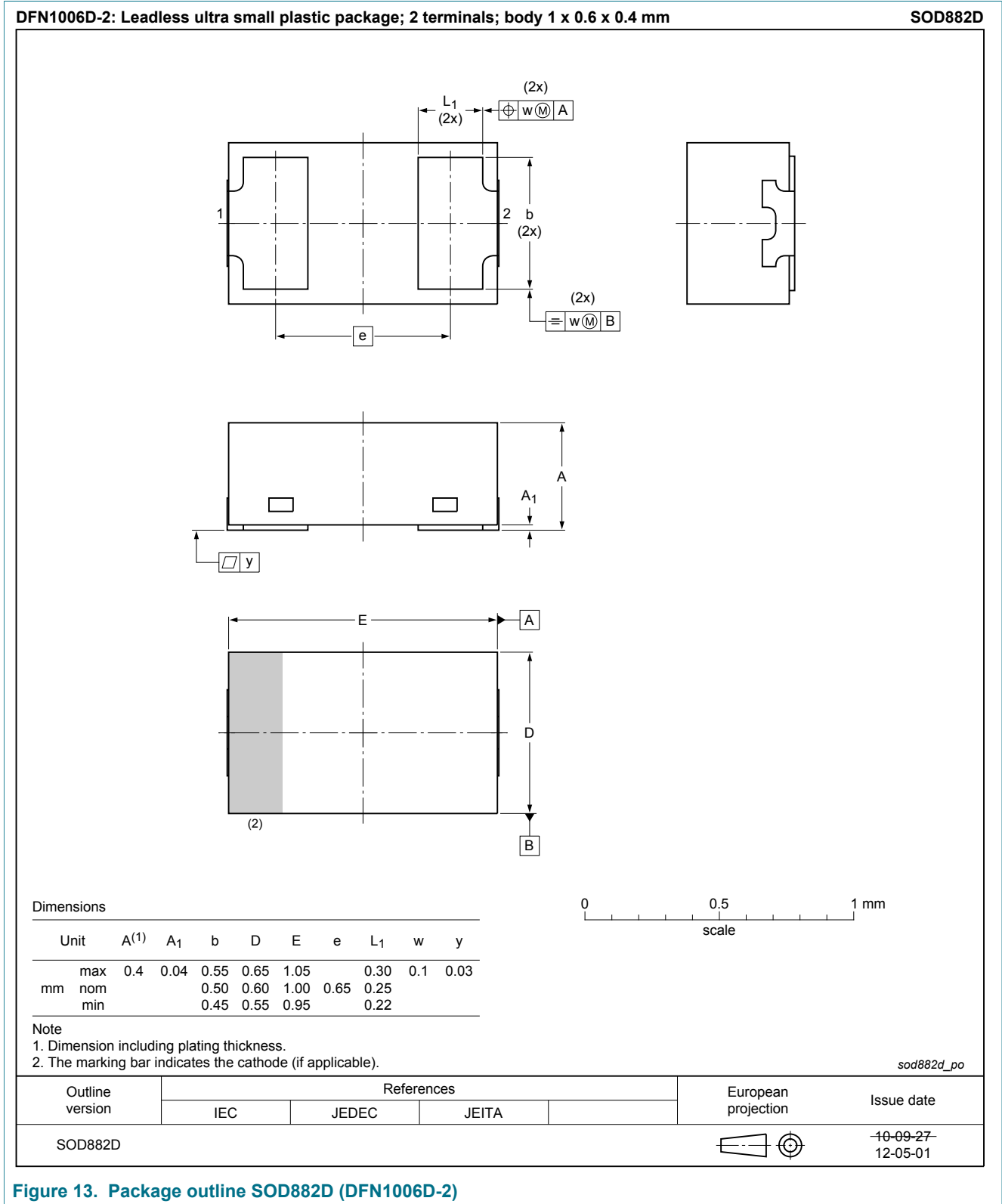
**7.2.2 Diode in parallel configuration**







**8 Package outline**



**Figure 13. Package outline SOD882D (DFN1006D-2)**

## 9 Abbreviations

**Table 7. Abbreviations**

Acronym	Description
PIN	P-type, intrinsic, N-type
SMD	surface-mounted device
RF	radio frequency

## 10 Revision history

Table 8. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BAP55LX v.5	20190212	Product data sheet	-	BAP55LX v.4
Modifications:	<ul style="list-style-type: none"><li>• <a href="#">Section 1.2</a> "Features and benefits" has been updated.</li><li>• The "Legal information" pages have been updated.</li></ul>			
BAP55LX v.4	20130806	Product data sheet	-	BAP55LX v.3
BAP55LX v.3	20110113	Product data sheet	-	BAP55LX v.2
BAP55LX v.2	20101216	Product data sheet	-	BAP55LX v.1
BAP55LX v.1	20070730	Product data sheet	-	-

## 11 Legal information

### 11.1 Data sheet status

Document status <sup>[1][2]</sup>	Product status <sup>[3]</sup>	Definition
Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
Product [short] data sheet	Production	This document contains the product specification.

[1] Please consult the most recently issued document before initiating or completing a design.

[2] The term 'short data sheet' is explained in section "Definitions".

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Date of release: 12 February 2019  
Document identifier: BAP55LX